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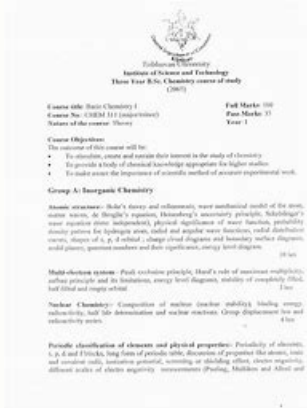
- The principle of corresponding states.
- State and explain the anomalous properties of gases such as vapour pressure, surface tension and viscosity.
- Experimental determination vapour pressure by isoteniscope method.
- Experimental determination of relative viscosity of a liquid by Ostwald's viscometer.
- Experimental determination of surface tension by capillary rise method.

3. Chemical Thermodynamics :- After studying this chapter, student should be able to :-

- Limitations of first law/ Necessary to study second law of thermodynamics.
- Cyclic process such as Carnot's cycle.
- Operation of Carnot's cycle to determine thermodynamic efficiency.
- Statement of second law based on thermodynamic efficiency.
- Energy of a system.
- Mathematical definition of entropy ($\Delta S = \frac{dq_{rev}}{T}$)
- Energy changes for system and surroundings for reversible and irreversible process.
- Energy changes for an ideal gas in isothermal, isochoric and isobaric process.
- Energy changes in chemical reaction.

Reference Books :- For term

1. Mathematical preparation for physical Chemistry By E. Dainton, Mc. Graw Hill publication.
2. University General Chemistry. By C.N. S. Rao Mc. Millan Publication.
3. Principles of Physical Chemistry. By Maxam and Prinston 4th Ed, Oxford and BHJ publication.
4. Physical Chemistry. By G.M. Barrow.





Thermodynamics
Chapter 11

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Thermodynamics is a branch of physics that deals with heat, work, and temperature, and their relation to energy, entropy, and the state of matter. It is a fundamental part of physics and chemistry, and it has many applications in engineering, biology, and other fields. The first law of thermodynamics states that energy cannot be created or destroyed, only converted from one form to another. The second law of thermodynamics states that the total entropy of a closed system always increases over time. The third law of thermodynamics states that the entropy of a perfect crystal is zero at absolute zero temperature.

The chapter is divided into three parts. The first part deals with the first law of thermodynamics, the second part deals with the second law of thermodynamics, and the third part deals with the third law of thermodynamics. The chapter also includes a section on the applications of thermodynamics in various fields.

Objectives

The general objectives of this chapter are:

1. To understand the concept of thermodynamics and its applications.

Plants, Standard Res. Journals, UK Member: Editorial Board, Journal of Pharmacy and Nutrition Sciences, (Life Sciences Global, Germany, Member: Editorial Board, IOSR Journal of Applied Chemistry, Associate Editor: International Journal of Chemical Research, Member: Editorial Board, Standard Research Journals, UK Member: Editorial Board, Journal of Applied Chemistry, IOSR Publications, India, Reviewer: International Journal of Medicinal Plant Research, International Scholars Journals Ltd. USA, Reviewer: African Journal of Pure and Applied Chemistry (AJPAC), Academic Journals, Nairobi, Reviewer: Standard Research Journal of Medicinal Plants, Standard Research Journals, UK, Reviewer: Philippine Journal of Science, Philippines, Reviewer: Journal of Analytical Oncology, Life Sciences Global, Germany, Reviewer: Medicinal Chemistry: Current Research, OMICS Publishing House, USA, THRUST AREA OF RESEARCH: Synthetic Organic chemistry, Bio-Organic chemistry, Pharmaceutical chemistry, Medicinal chemistry, Analytical Chemistry, Crystallographic studies, ORIGINAL CONTRIBUTIONS IN RESEARCH: Developed Chloramine-T as analytical reagent for the determination of number of keto groups in an organic compound, Chemia Analytyczna, (Warsaw) 2001, 46, 269-274. [Adopted in practical classes syllabi of post graduate course]. Developed Chloramine-T as analytical reagent for the estimation of ascorbic acid and estimation of pharmaceutical vitamin tablets, Oxidation Communications, 2002, 25(4), 566-570. [Adopted in practical classes syllabi of under graduate course]. Developed Silver nitrate mediated Chloramine-T as new synthetic reagent for the aziridination of alkenes, Tetrahedron, 2001, 57, 6993-6996. Developed CrO2 as new reagent for the in situ generation of nitrile oxides in 1,3-dipolar cycloaddition reactions, IOSR Journal of Applied Chemistry, 2012, 1(4), 20-23. ACADEMIC BODIES REPRESENTED: Member: Academic Council, Yuvaraja's College (Autonomous), Mysore. [June 2005- Sept 2006; Oct 2009-Dec 2011]. Chairman: Board of Examinations (UG), Yuvaraja's College (Autonomous), Mysore. [2005-06], Chairman: Board of Studies (UG), Yuvaraja's College (Autonomous), Mysore. [2005- 07], Member: Board of Examinations (PG), Yuvaraja's College (Autonomous), Mysore. [2005-06; 2012-13], Member: Board of Studies (UG), Govt. College for Boys (Autonomous), Mandya. [2006-07], Member: Board of Examinations (UG), JSS College (Autonomous), Mysore. [2007-08; 2010-11], Member: Board of Examinations (UG), JSS College for Women (Autonomous), Saraswathipuram, Mysore. [2009-10], Chairman: Board of Examinations (PG), Yuvaraja's College (Autonomous), Mysore. [2010-11], Member: (Special Invitee), Board of Studies (PG), Yuvaraja's College (Autonomous), Mysore. [2010-11], Member: Board of Studies (PG), St. Phelomena's College (Autonomous), Mysore. [2011-13], Member: Board of Studies Molecular Biology (PG), Yuvaraja's College (Autonomous), Mysore. [2012-13], Member: Doctoral Committee for Molecular Biology (Ph.D), Yuvaraja's College (Autonomous), Mysore. [2012], Member: Board of Examinations for Molecular Biology (PG), Yuvaraja's College (Autonomous), Mysore. [2012], Member: Board of Appointment in Chemistry, Maharani's Science College for Women, Mysore. [March 2013]. M.PHIL DISSERTATIONS/ PH.D. THESIS EVALUATED : DEGREES INTERNAL EVALUATION EXTERNAL EVALUATION M.Phil. DISSERTATIONS 10 04 Ph.D. THESIS 00 01 REFRESHER COURSES, TRAINING/ORIENTATION PROGRAMMES PARTICIPATED : Participant: Completed the short term course on "Unix and C, Computer applications" organized by the University of Mysore at Yuvaraja's college, Mysore. [20.05.1996 to 20.08.1996], Participant: Orientation program conducted for the college teachers under the college teachers' orientation scheme of UGC by the Academic Staff College, University of Mysore, Manasagangotri, Mysore. [02.03.1998 to 28.03.1998], Participant: Refresher course conducted for the college teachers under the college teachers' orientation scheme of UGC by the Academic Staff College, University of Mysore, Manasagangotri, Mysore. [10.10.2003 to 30.10.2003], Participant: Refresher course conducted for the college teachers under the college teachers' orientation scheme of UGC by the Department of Chemistry, Kuvempu University, Jnana Sahyadri, Shankaraghatta, Shimoga, [08.11.2005 to 28.11.2005], Visiting Professor: Delivered Special Lectures M.Phil. Degree students of Madhurai Kamaraj University (Distance Education), Bangalore Centre, Bangalore. [2007] Visiting Professor: Delivered Special Lectures to M.Phil. Degree students of Madhurai Kamaraj University (Distance Education), Mysore Centre, Mysore. [2007] Visiting Professor: Delivered Special Lectures M.Phil. Degree students of Periyar University (Distance Education), Mysore Centre, Mysore. [2007] Visiting Professor: Delivered Special Lectures to M.Sc. Analytical Chemistry students, UBDT Engineering College, Davanagere, Kuvempu University. [2008], Visiting Professor: Delivered Special Lectures to M.Sc. Chemistry students, St. Phelomena's College (Autonomous), Mysore. [2008-12], Visiting Professor: Delivered Special Lectures to M.Sc. students of Kuvempu University (Distance Education), St. Phelomena's College Centre, Mysore. [2008-12], GUIDANCE FOR RESEARCH DEGREES: Degree Awarded Submitted Working M.Phil. 09 01 00 Ph.D. 00 00 05 RESEARCH PROJECTS UNDERTAKEN sl No. Title of the Project FUNDING AGENCY AMOUNT Duration 1. Synthesis, characterisation and studies on their biological activity of pyrazoles and 1,3,4-oxadiazoles [Principal Investigator] UGC Rs. 78,000.00 Jan 2010-Nov 2011 Completed 2. Synthesis, Characterization of Coumarin based heterocycles and their efficacy as antimicrobial and antioxidant agents[Principal Investigator] UGC Rs. 9,44,300.00 2013-2015 Ongoing REVIEW PAPER PUBLICATIONS : K. Ajay Kumar, P. Jayaroopa, G. Vasanth Kumar, "A comprehensive review on 1,3,4-oxadiazoles and their applications", International Journal of ChemTech Research, 2012, 4(4), 1782-1791. 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